

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention will be specifically described with reference to several examples, but the invention is not construed as being limited thereto.

EXAMPLE 1

(1) 8 g of diallylorthophthalate prepolymer ("Daiso DAP Type A" produced by Daiso Co., Ltd.), 2 g of ethylene glycol dimethacrylate ("NK Ester 1G" produced by Shin-Nakamura Chemical Co., Ltd.), 0.3 g of benzil as a polymerization initiator, 0.1 g of Michler's ketone as a photo-sensitizing dye, and 22g of acetone were mixed at an ordinary temperature to prepare a recording material composition comprising these components.

(2) The composition was coated on one surface of a glass plate substrate having a dimension of 76 x 26 x 1.2 mm to a thickness of 10 μ m. Acetone was removed from the coated layer under reduced pressure, to produce a recording material having a two-layer structure comprising the substrate and the recording layer.

In the recording layer of the recording material, no phase separation or deposition of a polymer and a monomer was observed. Since the recording layer was substantially in a solid state, when touched with hand, it was not attached to hand, and did not drip. Therefore, the recording layer was excellent in handling, suffered no shift from the substrate, and was easy to transport. Further, the thickness of the recording layer was kept constant.

(3) A protective material comprising a PET film having a size of 76 x 26 mm and a thickness of 10 μ m was placed to cover the recording layer, to produce a three-layer photosensitive plate for recording a hologram.

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(4) Another hologram plate (diffraction efficiency: ca. 60%, resolution: ca. 2,000 lines per mm), in which 70 lines per mm had been recorded, as an original image was superposed closely on the surface of the protective material of the non-recorded photosensitive plate, and the hologram plate as the original image was irradiated with light emitted from a high pressure mercury lamp of 100 W (having peak wavelengths at 365, 410 and 430 nm) from the upper side thereof with a distance of about 10 cm for 1 to 3 minutes, so as to copy the hologram to the non-recorded photosensitive plate. When the illuminance was measured with an illuminance meter capable of measuring a wavelength of from 330 to 490 nm, the energy was 3.0 mW/cm² or less at a distance of 10 cm from the light source. Therefore, even when the recording was continued for 10 minutes, the energy became only about 1,800 mJ/cm².

A copy thus obtained suffered no coloring, and had a high brightness of a diffraction efficiency of about 30% without conducting development and fixing.

The copied hologram maintained a stable image for a long period of 3 months or more, after peeling the protective material. The record was formed only with the refractive index modulation, but not unevenness on the recording layer, and a transparent hologram having substantially no absorption in the visible region was obtained.

Since a hologram of good quality was obtained through the copying process described above, it was evidenced that a hologram could be produced by laser interference.

EXAMPLES 2 TO 8

(1) The same procedures as in item (1) of Example 1 were repeated to produce recording material compositions, except that the ratio of the diallylorthophthalate prepolymer and ethylene glycol dimethacrylate was changed as follows:

prepolymer/monomer = 9/1 (g/g) (Example 2)

prepolymer/monomer = 7/3 (g/g) (Example 3)

prepolymer/monomer = 6/4 (g/g) (Example 4)

prepolymer/monomer = 5/5 (g/g) (Example 5)

prepolymer/monomer = 4/6 (g/g) (Example 6)

prepolymer/monomer = 3/7 (g/g) (Example 7)

prepolymer/monomer = 2/8 (g/g) (Example 8)

(2) to (4) Photosensitive plates for recording a hologram were produced and holograms were copied by conducting the same manner as in items (2) to (4) of Example 1.

Copies thus obtained suffered no coloring, and had a high brightness of a diffraction efficiency of about 30% without conducting development and fixing.

The copied holograms maintained a stable image for a long period of 3 months or more, after peeling the protective material. The records were formed only with the refractive index modulation, but not unevenness on the recording layer, and transparent holograms having substantially no absorption in the visible region were obtained.